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| **Unit 2: Cells & Cell Processes** | | | | | | |
| Name: | Start Date: | | | 10/31/16 |  |  |
|  | Test 3 Date: | | | 11/21/16 |  |  |
| Period: | Teacher: Ms. Jost | | | |  |  |
|  |  |  |  |  |  |  |
| **Cells** | Submitted | Resubmit | Correct | Evidence of Learning | Date | Sign-Off |
| **Objective 6:** Compare prokaryotic and eukaryotic cells in terms of their general structures (plasma membrane and genetic material) and degree of complexity. |  |  |  | Catalyst: Characteristics of Life |  |  |
|  |  |  | Notes: Intro to Cells |  |
|  |  |  | HW: Article- Cell Types and Sizes |  |
|  |  |  | Catalyst: Latin Roots |  |
|  |  |  | Activity: Pro vs. Eu Identification |  |
|  |  |  | HW: History of Cell Theory |  |
| **Objective 7:** Summarize the structure and function of organelles in eukaryotic cells (including the nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and ways that these organelles interact with each other to perform the functions of the cell. |  |  |  | Catalyst: TBD |  |  |
|  |  |  | Notes: Cell Structure & Function |  |
|  |  |  | POGIL: Prokaryotic and Eukaryotic Cells |  |
|  |  |  | Worksheet: Cell Structure Coloring |  |
|  |  |  | HW: CHEGGER Review |  |

**Unit 2: Cells & Cell Processes**

Start Date: 10/31/2016 Test 3 Date: 11/21/2016

**Objective 6:** Compare prokaryotic and eukaryotic cells in terms of their general structures (plasma membrane and genetic material) and degree of complexity.

*Essential Question:* How do prokaryotes and eukaryotes differ?

*“I Can” Statements:*

* Compare and contrast prokaryotes and eukaryotes

**Objective 7:** Summarize the structure and function of organelles in eukaryotic cells (including the nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and ways that these organelles interact with each other to perform the function of the cell.

*Essential Question:* What are the main organelles (nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and their functions?

*“I Can” Statements:*

* Identify the structure and function of organelles
* Explain the interactions of organelles (e.g. nucleolus 🡪 ribosome 🡪 ER 🡪 Golgi)
* Use a compound light microscope

**Objective 8:**  Explain how homeostasis is maintained in a cell and within an organism in various environments (including temperature and pH).

*Essential Question:* How do cells maintain homeostasis?

*Essential Question:* How do organisms maintain homeostasis?

*“I Can” Statements:*

* Model the way a plasma membrane functions to control the way particles move in/out of a cell
* Predict the movement of water and/or solutes across the cell membrane, given a set of conditions
* Explain how energy is used to maintain homeostasis

**Important Vocabulary:**

**CATALYST 1:** What is a living thing? What are the requirements for life?

**CATALYST 2:** Use your Latin packet to define the following terms.

* Pro/karyote-
* Eu/karyote-
* Nucleus-

**CATALYST 3**: TBD

Biology (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Notes: Intro to Cells Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

**CHEGGER: Identify the 8 characteristics that all living things share:**

Biology (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Notes: Intro to Cells Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

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Cell Theory Scientists

|  |  |
| --- | --- |
| **Anton van Leeuwenhoek (1600s)** |  |
| **Robert Hooke (1665)** |  |
| **Mathias Schleiden (1830s)** |  |
| **Theodor Schwann (1830s)** |  |
| **Rudolph Virchow (1855)** |  |

|  |  |
| --- | --- |
| Prokaryote | Eukaryote |
|  |  |

Biology I (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Article: Cell Types & Sizes Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

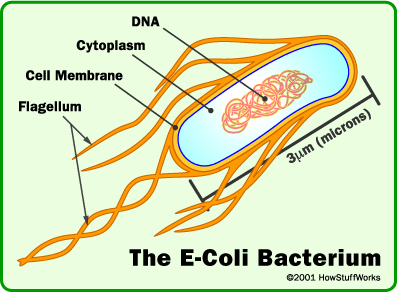
**Directions:** The passage below is an excerpt from <http://science.howstuffworks.com/cell1.htm>. Read the article and answer the questions that follow.

**Cell Parts**

Your body is made of about **10 trillion cells**. The largest human cells are about the diameter of a human hair, but most human cells are smaller -- perhaps one-tenth of the diameter of a human hair.

Run your fingers through your hair now and look at a single strand. It is not very thick -- maybe 100 microns in diameter (a micron is a millionth of a meter, so 100 microns is a tenth of a millimeter). A typical human cell might be one-tenth of the diameter of your hair (10 microns). Look down at your little toe -- it might represent 2 or 3 billion cells or so, depending on how big you are. Imagine a whole house filled with baby peas. If the house is your little toe, the peas are the cells. That's a lot of cells!

Bacteria are about the simplest cells that exist today. A bacteria is a single, self-contained, living cell. An ***Escherichia coli*** bacteria (or ***E. coli*** bacteria) is typical -- it is about one-hundredth the size of a human cell (maybe a micron long and one-tenth of a micron wide), so it is invisible without a [microscope](http://www.howstuffworks.com/light-microscope.htm). When you get an infection, the bacteria are swimming around your big cells like little rowboats next to a large ship.

Bacteria are a lot simpler than human cells. A bacterium consists of an outer wrapper called the **cell membrane**, and inside the membrane is a watery fluid called the **cytoplasm**. Cytoplasm might be 70-percent water. The other 30 percent is filled with proteins called **enzymes** that the cell has manufactured, along with smaller molecules like amino acids, glucose molecules and ATP. At the center of the cell is a ball of DNA (similar to a wadded-up ball of string). If you were to stretch out this DNA into a single long strand, it would be incredibly long compared to the bacteria -- about 1000 times longer!

An *E. coli* bacterium has a distinctive, capsule shape. The outer portion of the cell is the cell membrane, shown here. In *E. coli*, there are actually two closely-spaced membranes protecting the cell. Inside the membrane is the cytoplasm, made up of millions of enzymes, sugars, ATP and other molecules floating freely in water. At the center of the cell is its DNA. The DNA is like a wadded-up ball of string. There is no protection for the DNA in a bacterium -- the wadded-up ball floats in the cytoplasm roughly in the center of the cell. Attached to the outside of the cell are long strands called **flagella**, which propel the cell. Not all bacterium have flagella, and no human cells have them besides sperm cells.

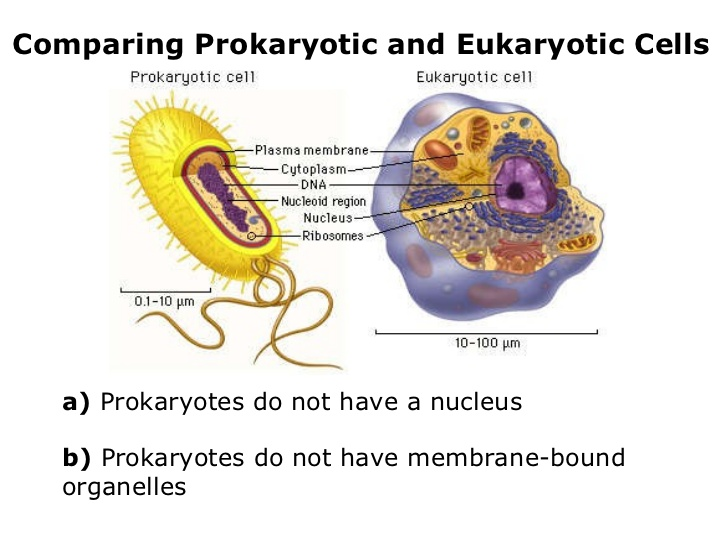
Human cells are much more complex than bacteria. They contain a special nuclear membrane to protect the DNA, additional membranes and structures like mitochondria and Golgi bodies, and a variety of other advanced features. However, the fundamental processes are very similar in bacteria and human cells.

1. How large is the typical human cell?
2. What are the simplest cells known to exist? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is the cytoplasm composed of?
4. Describe the DNA in a bacterial cell.
5. Bacterial cells are examples of *prokaryotic* cells. Human cells are examples of *eukaryoti*c cells. From the reading and your notes, what are the key differences between prokaryotic and eukaryotic cells?

Biology (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Activity: Identifying Prokaryotes and Eukaryotes Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

Use the image below to define the differences between Prokaryotes and Eukaryotes. Be sure to compare the shapes, structures, and size. You will then have to use your definitions to identify real images of prokaryotic and eukaryotic cells.



1. The defining characteristics of a ***prokaryote*** are:

2. The defining characteristics of a ***eukaryote*** are:

3. What are the four structures all cells must have?

1.

2.

3.

4.

Now, based on your definitions, you will be given an image of a real cell and you and your partner will have to justify whether the image depicts a prokaryote or eukaryote.

|  |  |  |
| --- | --- | --- |
| **Image #** | **Prokaryote or Eukaryote?** | **Justification** |
|  |  |  |
|  |  |  |
|  |  |  |
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**Analysis**

1. Did you correctly identify each image? Why or why not?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. What was the most obvious defining feature you used to help you identify the cell type? Why?

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3. In your own words, describe the difference between a prokaryotic cell and a eukaryotic cell.

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Biology (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

HW: History of Cell Theory Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

**Discovery of Cells and the Development of Cell Theory**  
  
 The study of cells started about 330 years ago. Before that time cells escaped notice because of their small size. With the invention of the microscope and its subsequent improvement, cells became visible and many new discoveries were made about them. Even today the study of cells reveals more detail, and its secrets, which are in fact the secrets of life itself, are revealed with ever increasing clarity.

**1665**: English Scientist and Microscopist Robert Hooke described a honeycomb-like network of cellulae (Latin for little storage rooms) in cork slice using his primitive compound microscope. Robert Hooke used the term cells to describe units in plant tissue (thick cell walls could be observed). Of course he saw only cell walls because cork cells are dead and without protoplasm. He drew the cells he saw and also coined the word cell. The word cell is derived from the latin word cellula which means small compartment. Hooke published his findings in his famous work,*Micrographia.*

Hooke, Robert (1635-1703), English scientist, best known for his sturdy of elasticity. Hooke also made original contributions to many other fields of science. Hooke was born on the Isle of Wight and educated at the University of Oxford. He served as assistant to the English physicist Robert Boyle and assisted him in the construction of the air pump. In 1662 Hooke was appointed curator of experiments of the Royal Society and served in this position until his death. He was elected a fellow of the Royal Society in 1663 and was appointed Gresham Professor of Geometry at Oxford in 1665. After the Great Fire of London in 1666, he was appointed surveyor of London, and he designed many buildings, including Montague House and Dethlehem Hospital.

Hooke anticipated some of the most important discoveries and inventions of his time but failed to carry many of them through to completion. He formulated the theory of planetary motion as a problem in mechanics, and grasped, but did not develop mathematically, the fundamental theory on which the English physicist Sir Isaac Newton formulated the law of gravitation. Hooke's most important contributions include the correct formulation of the theory of elasticity, which states that an elastic body stretches in proportion to the force that acts upon it; and analysis of the nature of combustion. He was the first to use the balance spring for the regulation of watches, and devised improvements in pendulum clocks. Hooke was also a poioneer in microscopic research and published his observations, which included the discovery of plant cells.

                                             
    Hooke's drawing of Cork Cells

**1670**: Antonie van Leeuwenhoek (1632-1723) described cells in a drop of pond water using a microscope. A Dutch businessman and a contemporary of Hooke. He also used microscopes and was a physicist. He made his own fine quality lens for use in monocular microscopes and was the first person to observe bacteria and protozoa. Some of his lenses could magnify objects 250X.

Anton van Leeuwenhoek, born Oct. 24, 1632, was a Dutch biologist and microscopist. He became interested in science when, as a Dutch businessman, he began grinding lenses and building simple microscopes as a hobby. Each microscope consisted of a flat brass or copper plate in which a small, single glass lens was mounted. The lens was held up to the eye, and the object to be studied was placed on the head of a movable pin just on the other side of the lens. Leeuwenhoek made over 400 microscopes, many of which still exist. The most powerful of these instruments can magnify objects about 275 times.

Although future microscopes were to contain more than one lens (compound microscopes), Leeuwenhock's single lens was ground to such perfection that he was able to make great advances and to draw attention to his field. Leeuwenhoek was the first person to observe single-celled animals (protozoa) with a microscope. He described them in a letter to the Royal Society, which published his detailed pictures in 1683. Leeuwenhoek was also the first person, using a microscope, to observe clearly and to describe red blood cells in humans and other animals, as well as sperm cells. In addition, he studied the structure of plants, the compound eyes of insects, and the life cycles of fleas, aphids, and ants.  
  
  
**1833**: English Botanist Robert Brown discovered the nucleus in plant cells.  
  
**1838**: Matthias Jakob Schleiden, a German botanist, concluded that all plant tissues are composed of cells and that an embryonic plant arose from a single cell.  He declared that the cell is the *basic building block* of all plant matter. This statement of Schleiden was the first generalizations concerning cells.    
     Born in Hamburg and educated in law at Heidelberg, Schleiden left law practice to study botany, which he then taught at the University of Jena from 1839 to 1862. A man of disputatious nature he scorned the botanists of his day who limited themselves to merely naming and describing plants. Schlieden investigated plants microscopically and conceived that plants were made up of recognizable units, or cells. Plant growth, he stated in 1837, came about through the production of new cells, which, he speculated, where propagates from the nuclei of old cells. Although later discoveries proved him wrong about the role of the nucleus in mitosis, or cell division, his conception of the cell as the common structural unit of plants had the profound effect of shifting scientific attention to living processes as they happened on the cellular level-a change that initiated the field of embryology. A year after Schleiden published his cell theory on plants, his friend Schwann extended it to animals, thereby bringing botany and zoology together under one unifying theory. 

**1839**:   Theodor Schwann, a German biologist, reached the same conclusion as Schleiden about animal tissue being composed of cells, ending speculations that plants and animals were fundamentally different in structure.  Schwann described cellular structures in animal cartilage (rigid extracellular matrix).  He pulled existing observations together into theory that stated:  1. Cells are organisms and all organisms consist of one or more cells.  2. The cell is the basic unit of structure for all organisms and that plants and animals consist of combinations of these organisms which are arranged in accordance with definite rules*.* In other words, **the cell is the basic unit of life.**This statement was the second generalization concerning cells and is the most important in the development of biology. It became known as the **cell theory**.

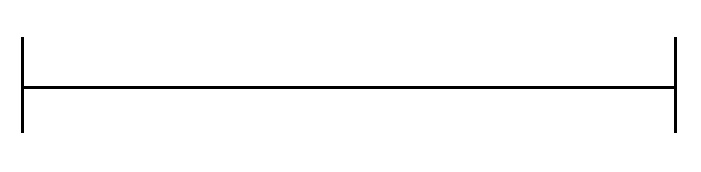
Schwann, Theodor (1810-82), German physiologist, generally considered the founder of modern histology, the study of the structure of plant and animal tissues. Schwann was born in Neuss and educated at the universities of Bonn, Warzburg, and Berlin. He was (1838-48) professor of anatomy at the University of Leuven in Belgium; there after until his death he was associated with the University of Libge, also in Belgium, serving as professor of anatomy from 1848 to 1858, when he became professor of physiology. Schwann achieved the physiochemical nature of life by applying the [cell theory](http://www.smithlifescience.com/cell_theory.html) of the German botanist [Matthias Jakob Schleiden](http://www.smithlifescience.com/matthias_jakob_schleiden.html) to the evolution of animal life. He also demonstrated that the mature tissues of all animals are traceable to embryonic cells. While assisting the German physiologist Johannes Miller in the Anatomical Museum of Berlin, Schwann discovered pepsin, the digestive enzyme, in the stomach epithelium, or membrane tissues, of animals. He also conducted valuable research on the processes of fermentation, purefaction, and muscular and arterial contraction. His principal work is Microscopic Investigations on the Accordance in the Structure and Growth of Plants and Animals (1839-1847).   
  
**1840**: Albrecht von Roelliker realized that sperm cells and egg cells are also cells.  
  
**1845**  Carl Heinrich Braun Cells were first identified as the basic unit of life

**1855**:  Taking Brown's original description of nuclei and observations by Karl Nägeli on cell division, the German physiologist, physician, pathologist, and anthropologist Rudolf Virchow was able to add a third tenet to the cell theory:  Omnis cellula e cellula, or all cells develop only from existing cells. Virchow, Rudolf (1821-1902), German pathologist, archaeologist, and anthropologist, the founder of cellularpathology. Virchow was born in Schivelbein, Pomerania (now Swidwin, Poland), and educated at the University of Berlin. In 1843 he became prosector at the Charite Hospital in Berlin, and in 1847 a university lecturer. In 1849 he was invited to the medical school of Wurzburg as professor of pathological anatomy, having been dismissed from his Berlin posts because of revolutionary activities. In 1856 he returned to Berlin as professor and director of the university's pathological institute.

Virchow was the first to demonstrate that the [cell theory](http://www.smithlifescience.com/cell_theory.html) applies to diseased tissue as well as to healthy tissue-that is, that diseased cells derive from the healthy cells of normal tissue. He did not, however, accept Louis Pasteur's germ theory of disease. He is best known for his text Cellular Pathology as Based on Histology (1850-1860). He engaged also in extensive research in the fields of archaeology and anthropology, producing numerous writings, among them Crania Ethnica Americana (1892). Other publications include discussions of topical political and social questions. Virchow was influential in German politics and from 1880 to 1893 served as a Liberal in the German Reichstag, where he opposed the policies of the German chancellor Prince Otto von Bismarck. He was instrumental in the establishment of the Pathological Institute and Museum in Berlin.

http://www.smithlifescience.com/CellTheory.htm

Activity: In the space below, create a timeline including **6** major developments in the history of Cell Theory and who is credited for each discovery.



# Biology I (H) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Notes: Cell Structures & Function Period: \_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Organelle** | **Function/Job** | **Structure**  (What is it made of, how is it arranged, what does it look like, drawing?) | **Found in prokaryotes, eukaryotes, or both?** | **Found in animal cells, plant cells, or both?** |
| \*Nucleus\* |  |  |  |  |
| Nuclear Envelope |  |  |  |  |
| Nucleolus |  |  |  |  |
| \*Ribosomes\* |  |  |  |  |
| **Organelle** | **Function/Job** | **Structure**  (What is it made of, how is it arranged, what does it look like, drawing?) | **Found in prokaryotes, eukaryotes, or both?** | **Found in animal cells, plant cells, or both?** |
| Rough Endoplasmic Reticulum |  |  |  |  |
| Smooth Endoplasmic Reticulum |  |  |  |  |
| Golgi Apparatus |  |  |  |  |
| Lysosomes |  |  |  |  |
| \*Vacuole\* |  |  |  |  |
| **Organelle** | **Function/Job** | **Structure**  (What is it made of, how is it arranged, what does it look like, drawing?) | **Found in prokaryotes, eukaryotes, or both?** | **Found in animal cells, plant cells, or both?** |
| \*Mitochondria\* |  |  |  |  |
| \*Chloroplast\* |  |  |  |  |
| \*Cell Wall\* |  |  |  |  |
| Cytoskeleton (micotubules & micofilaments) |  |  |  |  |
| Centrioles |  |  |  |  |
| **Organelle** | **Function/Job** | **Structure**  (What is it made of, how is it arranged, what does it look like? | **Found in prokaryotes, eukaryotes, or both?** | **Found in animal cells, plant cells, or both?** |
| \*Cell Membrane (Plasma membrane)\* |  |  |  |  |
| Cilia |  |  |  |  |
| Flagella |  |  |  |  |
| Leukoplast |  |  |  |  |
| Vesicles |  |  |  |  |

Biology I (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Worksheet: Cell Parts Coloring Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

**Animal Cell Coloring**

**Directions:** Choose a color for each of the parts below and fill in the square with the color of your choice. Color the cell part to match. Fill in the blank with the correct number.

□ Cell Membrane \_\_\_\_

□ Cytoplasm \_\_\_\_

□ Cytoskeleton \_\_\_\_

□ Flagellum \_\_\_\_

□ Golgi Apparatus \_\_\_\_

□ Lysosomes \_\_\_\_

□ Mitochondria \_\_\_\_

□ Nuclear Envelope \_\_\_\_

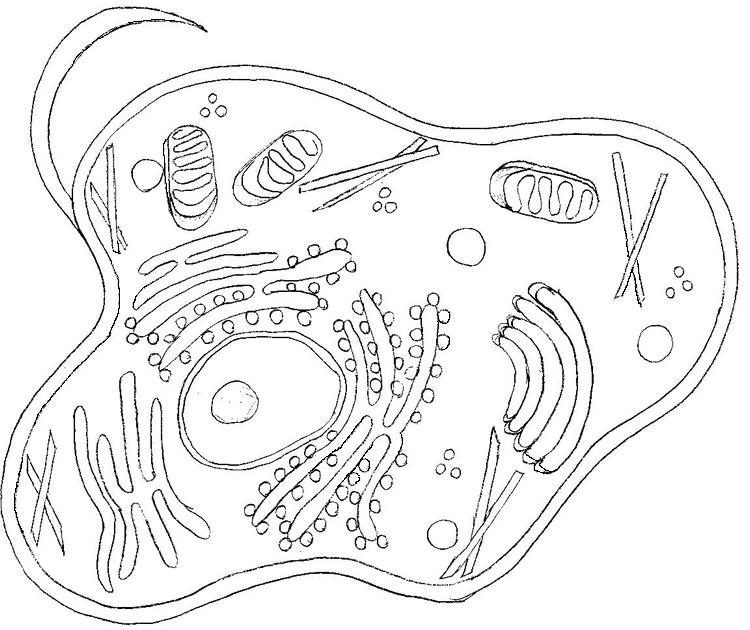
□ Nucleolus \_\_\_\_

□ Nucleus \_\_\_\_

□ Ribosomes \_\_\_\_

□ Rough Endoplasmic Reticulum \_\_\_\_

□ Smooth Endoplasmic Reticulum \_\_\_\_



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**12**

**13**

Biology I (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Worksheet: Cell Parts Coloring Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

**Plant Cell Coloring**

**Directions:** Choose a color for each of the parts below and fill in the square with the color of your choice. Color the cell part to match. Fill in the blank with the correct number.

□ Cell Membrane \_\_\_\_ □ Nuclear Envelope \_\_\_\_

□ Cell Wall \_\_\_\_ □ Nucleolus \_\_\_\_

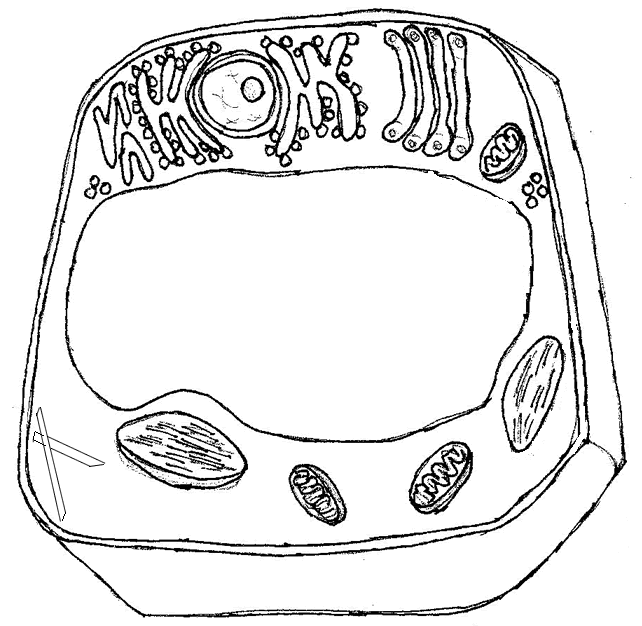
□ Chloroplasts \_\_\_\_ □ Nucleus \_\_\_\_

□ Cytoplasm \_\_\_\_ □ Ribosomes \_\_\_\_

□ Cytoskeleton \_\_\_\_ □ Rough Endoplasmic Reticulum \_\_\_\_

□ Golgi Apparatus \_\_\_\_ □ Smooth Endoplasmic Reticulum \_\_\_\_

□ Mitochondria \_\_\_\_ □ Vacuole \_\_\_\_



**1**

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**14**

Biology I (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Bell Ringer: #2 Period: \_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

1. What features make a eukaryotic cell a “true” cell as compared to a prokaryotic cell?  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. You are traveling through the cosmos and get caught in the gravitational field of an unknown planet. You decide to explore, and come across a colony of microscopic “dust.” Your colleague believes that this microscopic “dust” is actually composed of unicellular organisms while you have doubts. How would you use Cell Theory to prove who is correct?   
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Why must bacteria have ribosomes when they lack other organelles?  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Your professor shows you an electron micrograph of a cell with many mitochondria, golgi bodies, and a lot of rough ER. What kinds of cellular activities would require such an abundance of these three kinds of organelles?  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Complete the Venn diagram comparing and contrasting the functions of mitochondria and chloroplasts.

Mitochondria Chloroplasts

Biology (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

HW: CHEGGER Review Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

Identify five tasks that all eukaryotic cells must perform (hint: think about CHEGGERR). Then identify the organelle that helps the cell accomplish each task. Explain why each task is important in cell functioning.

|  |  |  |
| --- | --- | --- |
| Task | Organelle(s) | Importance of task |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Some metabolic disorders are usually characterized by fatigue and “exercise intolerance.” Hypothesize several reasons for this and refer to specific cellular structure(s) responsible.

|  |  |
| --- | --- |
| Organelle(s) | Reason |
|  |  |
|  |  |
|  |  |

